AMENDMENTS TO THE CLAIMS

1. (Currently Amended) An optimal operation controller of a plant comprising:

a correlation analyzing unit for obtaining correlation between a state of a predetermined process and each of one or more operation elements based on an operation status of the plant to be controlled, storing the correlation in a correlation table, and computing operation efficiency for ~~the~~ each operation element based on the operation status of the plant;

a categorization efficiency table for storing the operation efficiency of the predetermined process computed by the correlation analyzing unit; and

an optimal pattern searching unit for ~~referring to~~ performing a look-up of the categorization efficiency table based on ~~a~~ data input from the plant ~~and outputting~~ in order to output an instruction to control each of the ~~each~~ one or more operation elements during an implementation of the predetermined process without simulating or computing an operation efficiency.

2. (Currently Amended) The optimal operation controller of the plant of claim 1, wherein:

the categorization efficiency table stores the operation efficiency for an operation element and the operation efficiency of an entire plant, and

the optimal pattern searching unit controls the each element in consideration of the operation efficiency of the entire plant.

3. (Currently Amended) The optimal operation controller of the plant of claim 1, wherein the correlation analyzing unit categorizes the correlation between the state of the predetermined process and ~~the~~ each of the one or more operation elements into specific steps based on the data input from the plant to be controlled, and writes the correlation in the correlation table.

4. (Currently Amended) The optimal operation controller of the plant of claim 3, wherein

the categorization efficiency table stores data of an approximated curve generated by the categorized correlation, and

the optimal pattern searching unit outputs the instruction by referring to the data of the approximated curve.

5. (Currently Amended) An optimal operation controlling method of a plant, comprising:

~~a correlation analyzing for~~ obtaining correlation between a state of predetermined process and each of one or more operation elements based on an operation status of the plant to be controlled,

~~a~~ storing the correlation obtained by the correlation analyzing step into a correlation table,

~~an efficiency~~ computing efficiency for ~~the~~ each of the one or more operation elements based on the operation status of the plant,

~~a~~ storing the operation efficiency of the predetermined process obtained by the efficiency computing step into a categorization efficiency table, and

~~an optimal pattern searching for outputting~~ performing a look-up of the categorization efficiency table in order to output an instruction to control each of the one or more operation elements during an implementation of the predetermined process without simulating or computing operation efficiency ~~by referring to the correlation table and the categorization efficiency table~~.

6. (New) The optimal operation controller of claim 1, wherein

the predetermined process involves a plurality of operation elements, and

the categorization efficiency table stores the operation efficiency of each of the plurality of operation elements.

7. (New) The optimal operation controller of claim 6, wherein the plurality of operation elements are devices for configuring the plant during the predetermined process.

8. (New) The method of claim 5, further comprising:

storing the operation efficiency for each of the one or more operation elements and of the entire plant in the categorization efficiency table, and

controlling each of the one or more operation elements in consideration of the operation efficiency of the entire plant.

9. (New) The method of claim 5, further comprising:

categorizing the correlation between the state of the predetermined process and each of the one or more operation elements into specific steps based on the data input from the plant to be controlled, and

writing the correlation in the correlation table.

10. (New) The method of claim 9, further comprising:

storing data of an approximated curve generated by the categorized correlation in the categorization correlation table, and

referring to the data of the approximated curve when performing the look-up of the categorization correlation table in order to output the control instruction.

11. (New) The method of claim 5, wherein the predetermined process involves a plurality of operation elements, the method further comprising:

storing the operation efficiency of each of the plurality of operation elements in the categorization correlation table.

12. (New) The method of claim 11, wherein the plurality of operation elements are devices for configuring the plant during the predetermined process.

13. (New) A method for controlling a device to optimize the operation of a plant during a process, comprising:

collecting operational data during a first implementation of the process, the collected operational data relating to an operational parameter of the plant and an output of the device;

calculating efficiency values for the device based on the collected operational data;

correlating changes in the operational parameter to the calculated efficiency values based on the collected operational data to generate correlation values;

storing the generated correlation values in a look-up table;

referring to the look-up table in order to output a control instruction to the device during a second implementation of the process without simulating or computing efficiency.

14. (New) The method of claim 13, wherein

the correlating step includes determining that the operational parameter has a strong effect on efficiency of the device by performing statistical analysis on the generated correlation values, and

the generated correlation values are stored in the look-up table in response to the determination of the strong effect.

15. (New) The method of claim 14, wherein

the collected operational data includes a plurality of variables related to the operation of the plant during the process, and

the correlating step includes calculating a correlation coefficient for each of the variables according to the performed statistical analysis, the operational parameter being selected from the variables on the basis of the correlation coefficient.

16. (New) The method of claim 13, wherein the collected operational data is continuously sampled as an output quantity of the process changes, the method further comprising:

categorizing the sampling points of the collected operational data into a number of specific steps corresponding to a number of instructions for specifying an output quantity of the process.

17. (New) The method of claim 13, further comprising:

calculating efficiency values for the entire plant based on the collected operational data,

wherein the correlating step determines a relationship between efficiency of the device and efficiency of the entire plant, the control instruction being output to the device based on the determined relationship.

18. (New) The method of claim 17, wherein

the device is one of a plurality of devices to which control instructions are output by referring to the look-up table, the operational parameter being related to the operation of at least one of the other devices, and

the control instructions are output to the plurality of device in order to maximize the efficiency of the entire plant.

19. (New) The method of claim 13, wherein

the device is one of a plurality of devices in the plant, the collected operational data relating to one or more operational parameters,

the method is performed in such a manner to calculate efficiency values, generate correlation values, and store the generated correlation values in the look-up table for each of the plurality of devices, and

a control instruction is output to each of the plurality of devices by referring to the look-up table during a second implementation of the process.

20. (New) The method of claim 13, wherein the method is performed for a water conveyance system to optimize conveyance of water to a plurality of pump stations.